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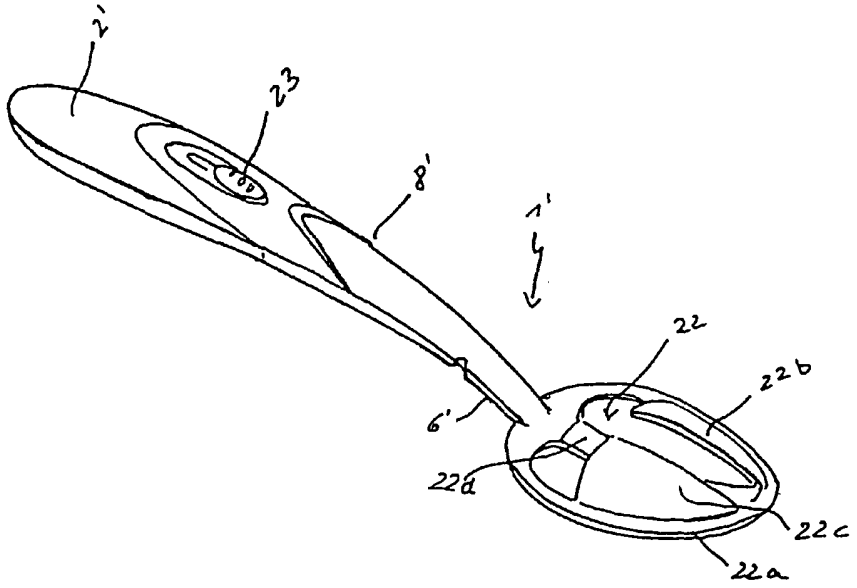
(54) Title: DEVICE AND CLEANING PAD FOR CLEANING OR TREATING SURFACES OR FOR APPLYING MEDIA TO SURFACES



(57) Abstract: A cleaning device for cleaning surfaces such a toilet bowls or baths comprising a handle having a trigger at one end and a head at the other. The head is adapted to fit into a disposable cleaning pad in the form of a slipper. The cleaning pad is fixed to the head during the cleaning operation and it may be attached or removed from the head by fixing means actuated by the trigger means. The fixing means are actively disengaged from the cleaning pad by ejection means.

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Device and cleaning pad for cleaning or treating surfaces or for applying media to surfaces

The present invention relates to a device for cleaning or treating surfaces or for applying media to surfaces, especially for cleaning toilet bowls and the like. The invention further relates to a cleaning pad that may be attached to said device to effect cleaning operations and be removed easily after use.

Cleaning a toilet bowl is typically one of the most undesirable jobs for most persons. Nevertheless, toilet bowls must be kept clean in order to prevent sanitary problems, the potential for irritable smells, and the possibility of harmful bacteria build up.

Conventional cleaning brushes or sponges are unpleasant to use because of the excessive dripping of water from the cleaning surfaces, which may result in unsanitary storage between use.

However, the use of cleaning compositions which are dispensed as a dosage upon flushing of a toilet, generally are not as effective as manual scrubbing.

To overcome these shortcomings in conventional cleaning devices and compositions, many proposals have been made for cleaning devices which employ disposable cleaning pads. Such devices generally consist of a handle having a trigger mechanism at one end and a head at the other. The head is provided as a pair of opposable jaws which may be opened and closed using the trigger mechanism to engage and disengage a disposable cleaning pad. One problem with the opposable jaw arrangement is that the cleaning pad is only held by the jaws at the point at which they clamp together such that some of the cleaning pad hangs limply from the head. As a result, cleaning force applied through the head is not communicated efficiently to the cleaning pad. Furthermore, those parts of the pad not firmly held by the head will be prone to fold, slip or roll thereby compromising cleaning performance.

Another prior art cleaning device is disclosed in US 3,225,375. This cleaning device has a handle and a head portion, the latter being adapted to receive a disposable

cleaning pad in the form of a slipper. The head is bulbous and is adapted to have a slipper placed over it such that the slipper closely conforms to the shape of the head. Accordingly, when the user applies force to the head, the force is efficiently communicated to the surface of the slipper in contact with the surface to be cleaned to exert cleaning pressure. Further, as the slipper conforms to the contours of the head, there is a reduced tendency for the slipper to fold or roll. Because the slipper is simply slipped over the head and not clamped by opposable jaws, the head is provided with fixing means in the form of barbs that are upstanding from the head and project rearwardly towards the direction of the handle such as to oppose removal of the slipper once attached to the head. A problem with having such fixing means on the head is that they are provided on the bottom surface of the head through which frictional forces are directed such that during a cleaning operation the fixing means may be compromised, that is, loosened or even torn from the cleaning pad. Still further, if the fixing means remains engaged on the slipper during the cleaning process then it may snag the slipper during its removal, particularly as the slipper will be sodden with water and will already have a tendency to cling to the head during a cleaning operation.

We have now found a cleaning device that is substantially free of the disadvantages of the prior art.

Accordingly, the invention provides in a first aspect a cleaning device comprising a handle having towards one end a grip portion and trigger means, and at the other end a head adapted to receive a cleaning pad in the form of a slipper, the head comprising a bottom surface which bears against a surface to be cleaned in frictional engagement; and fixing means actuated by the trigger means to releasably fix the cleaning pad to the head wherein fixing means are provided on the device other than on said bottom surface.

The device according to the invention is possessed of numerous advantages: The cleaning pad may be releasably fixed to the head by operation of the trigger means at a position remote from the head. Attachment and release of the cleaning pad may therefore be conducted without the need for a user to touch either the head or the cleaning pad by hand. Furthermore, given that the fixing means are not provided on a

surface of the head that is subject to cleaning frictional forces, the attachment of the cleaning pad to the head is not compromised during a cleaning operation.

The handle may be formed as an elongate member that is of a length such that a user's hand is sufficiently removed from the head to permit sanitary cleaning of a surface. The handle should permit the user to exert cleaning pressure along its length and through the cleaning head in order to provide sufficient frictional force to provide the desired cleaning action, and the handle should therefore be formed of a sufficiently rigid material , e.g. rigid plastics materials, for this purpose.

The handle may consist of a single elongate member and it may be hollow or channelled longitudinally. The hollow or channel may house a portion of the trigger means. In the alternative, the handle may comprise two handle sections which are configured in a complementary manner such that when they are brought together in opposed relationship they form conjointly the handle. In such an embodiment, at the end of each handle section is a head section, which head sections are likewise configured in a complementary manner such that when they are brought together in opposed relationship they form conjointly the head. The two handle sections are joined pivotally such that they may open and close about the pivot in a scissor-like manner. The two sections may be pivotally connected at any point along their length although for ease of leverage for the user, the pivot should be as far away from the grip portion of the handle as is practical. This provides that the pivot may be at the tip of the head sections, however, it is preferred that the pivot is formed further up the handle in the direction of the grip portion in order that this pivot is clear of the water in, e.g. a toilet bowl in normal use, in order to prevent the build up of germs in the pivot joint. For ease of manufacture, the pivot connection may be formed by an integrally moulded stud on one handle section that snaps into, and rotates freely within, a recess or hole formed in the opposing handle section when the two handle sections are connected.

The two handle sections may be longitudinally recessed in a complementary fashion such that when they are closed together the handle takes the form of a longitudinally hollow member. The two sections may be locked together in a closed position using suitable locking means, for example, one section may be provided with a tongue and the other section provided with a co-operating recess for receiving the tongue. The

tongue being adapted to snap into the recess in locking relationship and be easily opened when the user provides gentle pressure to urge the handle sections apart.

The head consists of a body having a bottom surface which is adapted to bear against a surface to be cleaned in frictional engagement. Because surfaces to be cleaned will often have some curvature, it is preferred if the head is either formed of a resilient material such that the bottom surface will conform to curved surfaces under pressure, and/or is jointed or articulated such that certain portions of the bottom surface may deform to conform to the curved surface. The head additionally comprises side walls. The cleaning pad extends upwardly of the bottom surface over the side walls which support it. In this way, movement of the cleaning head is communicated to the cleaning pad such that it is held in tight conformance with the head as it moves forward and from side to side on a surface to be cleaned. Further, as the pad does not present a free or exposed edge to a frictionally engaging surface, the pad resists folding or rolling during cleaning operations.

The head may be of any desirable shape. It may be an essentially flat body, or it may be bulbous, e.g. in the form of an ellipsoid. The latter configuration is advantageous not only in the cleaning of curved surfaces, which may be typically encountered with toilet bowls and baths, but also because of its relatively bulky form will promote a cleaning pad in the form of a slipper, to form a tight relationship with the head.

Preferably, the head is rather smooth and lacking in surface detail or contours in order that germs cannot easily gather on its surface. It may be of solid construction or in the form of a hollow body in which case the hollow head may communicate with the longitudinal hollow in the handle.

The head may be formed of a variety of materials. Preferably it is formed of a resilient material that allows it to deform under pressure to adopt the contours of the surface to be cleaned. The head and handle may be integrally formed, for example by a moulding or extrusion process.

The fixing means ensures the secure fitting of the cleaning pad to the head such that the cleaning pad remains firmly in contact with the contours of the head during the

cleaning process and cannot move backwards off the head during the cleaning process. Further, after cleaning, the fixing means is readily disengaged in order to permit removal of the cleaning pad. Both the fixing and the disengagement procedures may be actuated from the grip portion of the handle using the trigger means such that both procedures may be conducted in a sanitary way. The fixing means may take any of a variety of forms to achieve this dual purpose.

Thus, the fixing means may be provided as a clamp provided on the handle proximally to the point at which head and handle meet. The clamp may be actuated using the trigger means and which may be operated from the grip portion of the handle. Conveniently, the trigger means may comprise a rod, located in the hollow handle or ir the longitudinal channel, which projects outwardly of the handle in the form of a button which can be operated from the grip portion, and is connected to the clamp. Thus the user may open the clamp to disengage the cleaning pad simply by depressing the button. The rod may be spring-loaded, the spring being biased against this movement such that when the button is released, the spring returns the clamp to its closed position.

Other fixing means are contemplated by the present invention. Thus, a cleaning pad may be slipped onto the head in a manner described above, and a portion of the cleaning pad may be adapted to hook onto or snag a portion of the handle and thereby fix the cleaning pad to the head. In particular, the cleaning pad may comprise an elongate tab portion that extends outwardly of the slipper generally in the direction of the handle. This tab may terminate in an approximately T-shaped portion. The handle may be provided with a bore running through the handle in a direction essentially normal to its length which is adapted to receive the elongate tab portion of the cleaning pad such that when it has passed through the bore, the T-shaped portion snags or catches the handle such that the tab portion cannot return through the bore under the normal forces experienced during the cleaning process. Accordingly, the cleaning pad is held firmly in place during the cleaning process.

If the handle is comprised of two handle sections pivotally connected as hereinabove described, each handle section may have a complementary recess such that when the handle is closed, the two recesses cooperate to form the bore through the handle.

In a similar manner, the handle may contain a slot or groove and a portion of the cleaning pad simply slides into the slot or groove, is held in frictional engagement with the handle an thereby fixes the cleaning pad to the head. Still further, when the handle is comprised of two opposable sections, a portion of cleaning pad may simply be gripped between the two sections when they are closed together.

Still further fixing means may be provided by simply inserting the cleaning pad over the head and fixing a portion of the cleaning pad to the handle, for example with a suitable adhesive, e.g. a silicone-based adhesive. In particular, an elongate tab portion as hereinabove described may be provided with an adhesive surface which enables the tab to be stuck directly onto the handle. Alternatively, if the tab terminates in a T-shaped portion as aforementioned, the ends of the T may be provided with adhesive surfaces such that the tab may be looped around the handle and connected together to form a collar around the handle and thereby fixing the cleaning pad to the head.

In yet another embodiment, the fixing means may be provided on the head in the form of one or more retractable pins which may be actuated by the trigger means. In such an embodiment, the pins are retracted by depressing the button portion projecting outwards of the handle at the grip portion (a spring may be provided on the trigger means that is biased against this movement), a cleaning pad is then slipped over the head and the button thereafter release to urge the pins into fixing contact with the cleaning pad. The pins are held in contact with the pad under tension of the spring. Once a cleaning operation is completed, the pins may be retracted to disengage the cleaning pad to permit its removal.

The trigger means has been described above in terms of a rod, secreted in a hollow provided in the handle, which connects a button projecting from the handle, to a clamp. However, in a device comprising pivotally-movable handle sections, the trigger means may be provided by the relative movement of the handle sections which movement may, for example, cause the aforementioned bore to open and close to permit attachment or disengagement of the elongate tab portion of the cleaning pad. Alternatively, opening the handle sections may cause the elongate tab portion that is fixed on or around the handle sections to tear away from the handle thereby to disengage the cleaning pad from the head.

A device according to the present invention may additionally be provided with ejection means which assists in the removal of a cleaning pad from the cleaning head after a cleaning operation is complete. Ejection means, upon actuation, either remove a cleaning pad entirely from the cleaning head or disrupt, e.g. rupture or tear the cleaning pad to an extent that its removal from the cleaning head is rendered facile. In addition to its disrupting the cleaning pad, it is a characteristic of the ejection means that it actively disengages the cleaning pad from the fixing means.

Ejection means may play an important role in the removal of a cleaning pad from a cleaning head. In particular, when a cleaning pad is sodden after use it tends to cling to the head even after the fixing means are disengaged from the pad. Removal may only be effected by tearing the pad off by hand, or if the device is vigorously agitated. Ejection means provide additional impetus to remove the pad by disrupting it such that it no longer can cling firmly to the head and its removal may be effected entirely or may be substantially facilitated. The prior art device disclosed in US patent 3,225,375 contains means for tearing a used cleaning pad, however, these means are unable to actively disengage the cleaning pad from the fixing means as this term is meant in the present invention. This is because the fixing means are provided as upstanding barbs on the head which are reverse directed such that even a torn pad must still be slid across the barbs to effect removal which may be substantially hindered as a result.

In one embodiment of the present invention, the ejection means may be actuated by pulling the handle sections open about the axis of the pivot connection which causes the head sections to open and in the process rupture a cleaning pad attached thereto. In such an embodiment, ejection means are effectively provided by the relative movement of the head sections. For optimal ejection, movement of the handle sections should translate as movement in the head sections to the greatest extent possible. To this end, it is less preferred if the pivot of is provided at the tip of the head section. In such an arrangement handle movement will translate to considerably less head movement than would be the case if the handle sections were pivotally connected higher up the handle towards the grip portion.

In another embodiment, the ejection means may be provided by a retractable member, e.g. a rod, that may be located in the hollow provided in the handle and head. At the

grip portion end of the handle the retractable member may project outwards of the handle to terminate in a button portion; whereas the other end of the retractable member may terminate in an abutment portion which may be flush with and form part of a surface of the head. Actuation of the retractable member by depressing the button will cause the abutment portion to move out of the plane of the head surface to bear against a cleaning pad to urge the latter off the head.

In another aspect of the invention there is provided a cleaning pad suitable for use with a cleaning device as hereinabove described.

The cleaning pad must be capable of being firmly attached to the head of a cleaning device, conform with the contours of the head and be capable of withstanding disintegration as a result of the frictional forces associated with the cleaning process. Additionally, it should be easily flushable in a toilet bowl after use. It should be inexpensive to manufacture on a large scale.

The cleaning pad may be manufactured from a water-dispersible or water soluble, preferably biodegradable material, that has sufficient mechanical strength when wet for a normal period of use to permit of the cleaning process. Suitable materials include paper, cardboard, pressed paper pulp and the like. To add stiffness and a better cleaning action, surface structure may be added to the pad, for example ridges, dots or dimples. Cleaning compositions may be secreted in the cleaning pads in a manner known *per se*. Cleaning pads are well known in the art and the skilled person would appreciate other types of materials that would be suitable for the intended purpose.

In one embodiment, the cleaning pad comprises a pad of material that is folded and seamed to form a slipper open at one to receive the head. The other end of the slipper may be closed such that the front end of the head abuts the end of the slipper to prevent further movement in the direction of entry of the head. The cleaning pad thereby conforms to the shape of the head and grips the head firmly. Projecting outwards from the aforementioned open end of the slipper, the cleaning pad may be provided with an elongate tab portion. At the end of the tab portion remote from the pocket, the tab may be adapted to co-operate with the fixing means to releasably secure the cleaning pad to the head of the cleaning device. As discussed hereinabove,

the end of the tab portion may contain an adhesive surface which may be stuck to the handle; or it may terminate in a T-shaped projection which may be wrapped around the handle and the ends stuck together to form a collar; or it may contain a T-shaped projection which passes through a bore in the handle and thereby catches or snags the handle to secure the cleaning pad onto the head.

In an alternative embodiment, the cleaning pad may be in the form of a slipper consisting of an essentially flat body that fits over the bottom surface of the head. In such an embodiment, the pad additionally comprises a circumferential raised surface which is in frictional contact with the side walls of the head when the flat body of the pad is placed in contact with said bottom surface. Additional fixing means may be provided on the head, for example the retractable pins has hereinabove described for further securing the cleaning pad to the head.

Specific embodiments of cleaning pads of the present invention are shown in the figures below.

Cleaning pads may be stored in a suitable container and may be provided in a stacked arrangement such that the top most cleaning pad may be easily slipped onto the cleaning head without any direct hand contact.

The invention is further illustrated with reference to following description and drawings relating to specific embodiments of the present invention.

Fig. 1 shows a side view of a first inventive cleaning device;

Fig. 2 shows a partial view of the cleaning device of fig. 1 with a pad attached;

Fig. 3 shows an inventive cleaning pad with a pocket and a rearward tab;

Fig. 4 shows a grip portion of a cleaning device;

Fig. 5 shows a second inventive cleaning device;

Fig. 6 shows a sectional view of the device of fig. 5;

Fig. 7 shows a sectional view of a third inventive cleaning device with a pad attached;

Fig. 8 shows a side view of the device of fig. 7;

Fig. 9 shows a side view of the device of fig. 7 with pad attached;

Fig. 10 shows a perspective view of the device of fig. 7;

Fig. 11 shows a second cleaning pad;

Figure 12 shows a perspective view of an another cleaning device and a cleaning pad adapted to fit thereon.

Figures 13-16 show perspective views of another cleaning device according to the present invention. Figures 15 and 16 show the device in a closed/open position with a cleaning pad attached/disengaging.

Figures 17 through 24 show plan and side-views of specific cleaning pads.

Fig. 1 and 2 show a first inventive cleaning device 1 designed as a hygienic replacement for conventional WC brushes in a side view without cleaning pad (fig. 1) and with an attached cleaning pad 4 (fig. 2). The cleaning pad 4 itself is shown in fig. 3. The device comprises an elongate handle 8 having a grip portion 2 at the upper part 8a and a cleaning head 3 at its opposite lower part 8b. The cleaning head 3 is made of water impervious foam material capable of only small deformations under the stresses normally experienced during the WC cleaning operation. The cleaning head 3 has a oval shape which is dimensioned to fit preferably tightly into and to be at least partly surrounded by the cleaning pad 4. The flexible cleaning pad 4 comprises therefore a flat oval base portion 19, made of tissue paper, non-woven fabric or the like. Preferably, the pad 4 consists of paper laminate which protects the foam from contamination and is wiped over the surface of the WC, possibly with an active cleaning powder integrated into the bottom layers of the pad. The pad 4 further comprises a sheet 17 attached to the base portion 19 and forming a cleaning head receiving pocket 18 with the base portion 19. The pad 4 further comprises an elongate

tab 21, preferably made of tear-resistant material, preferably card, located opposite the pocket and projecting upwardly and rearwardly. The device 1 further comprises fixing means 5 for affixing a pad to the device. In fig. 1 and 2, the fixing means 5 include a clamp 6 located near the lower part 8b of the handle 8. The clamp 6 is able to secure a pad 4 that is slipped over the cleaning head 3 by clamping a pad portion, here the tab 21, and hold it in place during scrubbing. The clamp 6 is movable via a trigger mechanism 9, including at least one rod 9' by actuating first operating means 11. In fig. 4, the means 11 for actuating the trigger are located nearby the grip portion 2 and include a collar 11' which is arranged around the upper part 8a of the handle 8 and is able to slide up and down. The rod 9' is directly or indirectly connected to the collar 11' and moves the clamp 6 when the collar 11' is pulled and/or pushed. In fig. 1 and 2 the fixing means 5 are shown in solid lines in a first position where a pad can be held in place. The fixing means 5 are shown in dashed lines in a second position where a pad is released (fig. 1 only). Returning means 10 including a spring 10' connected to the clamp 6 keep the fixing means 5 in the first position when the fixing means 5 are not actuated. The advantage is that the user needs no force to keep the pad 4 attached. When pulled over the cleaning head 3 the base portion 19 of the flexible pad 4 is stretched over the convex bottom portion 7 of the cleaning head 3. Its bottom side 20 forms an unruffled cleaning portion for homogeneous application of cleaning detergent and controlled scrubbing.

Fig. 4A, B show the grip portion 2 of the device of fig. 1 and 2 with the actuating means 11 in the first and second state respectively. As an alternative to the construction of fig. 1, 2 returning means 15 including a spring 15' are arranged near the grip portion 2. The collar 11' is pressed downward by the spring 15' (Fig. 4A), when not pulled upward by the user (Fig. 4B). By pulling the collar 11' upward, the fixing means 5 move, and a pad can be brought into the attaching position.

Fig. 5 and 6 show another example of an inventive device 1' with a handle 8'. The cleaning head 3' comprises a three dimensional frame 22 with an oval ring 22a, two wings 22b, 22c bent upward and a bridge 22d bent downward. The cleaning head 3' can be manufactured from a flat solid piece by cutting the shapes of wings and bridge and bending these pieces appropriately. Alternatively, it is manufactured by injection moulding.

By moving a clip 23 located near the grip portion a clamp 6' is lowered or raised onto the tab 21 of the cleaning pad 4, as shown in the partly sectional view of fig. 6. The clamp 6' is part of the fixing means 5' which further comprise a trigger mechanism 24. The cleaning pad 4 is designed to fit around the cleaning head 3', stretching over its bottom portion 7'. A tablet 26 with cleaning detergent is attached at the bottom side 20 of the base portion 19. After use, the clamp 6' is raised to release the tab 21 and the head 3' and pad 4 shaken under water to eject the pad which can then be flushed away.

Fig. 7 to 10 show a third embodiment of the inventive device 1", with attached pad (fig. 7, 9) and without (fig. 8, 10). The handle 8" consists of two separated pieces, a shaft 8c and a lower part 8b'. The lower part 8b' of the handle 8" is an integral part of the cleaning head 3", e.g. moulded in one piece with the frame 22', as shown in the sectional view of fig. 7. A collar 30 which may be fixed to or an integral part of the shaft 8c is connected to the lower part 8b' via a spring mechanism 31. The collar 30 as a part of the fixing means 5" comprises a clamp 6" resting on the wings 22b', 22c' of the frame 22', as shown in fig. 7, 9 and 10, unless the collar 30 is pulled upward, as shown in fig. 8. A portion of the cleaning pad 4' is clamped between the clamp 6" and the frame 22' to secure the pad 4' to the device 1".

A cleaning pad 4' for the use with a device 1" as shown in fig. 7 to 10 is shown in fig. 11. Like the cleaning pad 4 of fig. 3 the cleaning pad 4' has an oval shape which is dimensioned to fit preferably tightly around the cleaning head 3" of fig. 7 to 10. The cleaning pad 4' comprises a flat, but flexible oval base portion 19' and a sheet 17' attached to the base portion 19' and forming a cleaning head receiving pocket 18' with the base portion 19'. The pad 4' further comprises an elongate tab 21' located at the pocket and projecting rearwardly that can be gripped by the clamp 6". A tablet 26' with cleaning detergent is attached to the bottom side 20' of the pad 4', as shown in fig. 7. The cleaning pads 4, 4' preferably consist of water degradable materials, e.g. laminated or non-woven cellulose, tissue paper and/or fleece material, which are preferably recycled, welded by heat, pressure or adhesive. The tabs 21, 21' are preferably made of card or the same material as the pad itself. Preferably several pads

are stored in a dispenser with an opening through which the cleaning head can be inserted for loading a fresh pad.

When not in use, the device may be hung from a wall fitting or may be located in a suitable station device, for example a floor-standing base having a housing that is adapted to receive the head portion. The device may easily be removed or inserted into the station by gripping and applying pressure to the handle.

The device 32 shown in figure 12 comprises a handle 33 having at one end a trigger 34 and at the other end a head 35. The handle is hollow and internal of the handle is a trigger mechanism (not shown) which connects the trigger 34 with retractable pins. Depressing the trigger 34 causes the retractable pins to be withdrawn to permit a cleaning pad 36 to be fitted over the head 35. A spring on the trigger mechanism (not shown) is biased the movement of the trigger such that when the user releases the trigger, the retractable pins extend outwardly of the head to abut a circumferential wall 37 on the cleaning pad and thereby fix the cleaning pad tightly to the cleaning head. When the cleaning pad is to be removed after a cleaning operation, the trigger is simply actuated to retract the pins and the cleaning pad can be gently urged off the cleaning head.

Figure 13 and 14 shows a cleaning device wherein the handle 39 is formed of two opposed handle sections 39a,39b which are pivotally mounted 41. the head 40 is similarly composed of head sections 40a,40b. Fixing means are provided by a bore 42 which runs through the handle in a direction essentially normal to it length. It can be seen more clearly from Fig 14 that the bore is provided by recesses 42a,42b formed in each of the handle sections which cooperate to form the bore when the handle sections are in closed relationship.

Figure 15 shows the same device in its closed position and having a cleaning pad 43 slipped over the head. The cleaning pad comprises an elongate tab portion 44 (partly shown) which extends rearwardly of the main body of the cleaning pad 43 and passes through the fixing means 42 to snag or catch the handle by means of the T-shaped portion 45. When the handle sections are opened (see Figure 16) by the user, the head sections separate tearing the cleaning pad and considerably facilitating the removal of

the pad. Furthermore, as the handle is opened so the fixing means widens thereby to actively disengage the cleaning pad from the handle. In Figure 16 one can see that the fixing means are opening and the elongate tab begins to disengage by slipping through the bore 42. It follows that the opening of the handles by the user provides a very simple and elegant trigger means for engaging and disengaging the fixing means, and at the same time ejection means within the meaning of the present invention. To add a new cleaning pad, the handle sections are simply closed together and the head sections close in a corresponding manner to permit a new cleaning pad to be inserted.

Figure 17 shows a plan view of a cleaning pad 43 having an essentially T-shaped end portion 45 to the elongate tab portion 44. Part of the handle 39 is shown in plan view to illustrate how the elongate tab portion passes through the bore 42 and the T-shaped end portion 45 snags the handle.

Figure 18 shows another cleaning pad in plan view and in end-section having an elongate tab 44 having an adhesive surface 51. The elongate tab may pass through the bore 42 on the handle and loop back on itself before being stuck onto the body of the cleaning pad 43 by means of the adhesive surface 51.

Figure 19 shows another cleaning pad in plan view having an elongate tab portion 44 terminating in a T-shaped portion 46. The T-shaped portion may be wrapped around a handle (not shown) and fastened thereon by tightening and tying the draw-string 47. A similar pad is shown in Figure 22, however, the draw-string is replaced with adhesive fastening means provided by the adhesive surfaces 51. Figure 23 show a plan view of a variant cleaning pad wherein the essentially T-shaped end portion is replaced by an essentially L-shaped end portion 52 which may be wrapped around a handle a fastened thereon by means of the adhesive surface 53.

Figure 20 shows yet another cleaning pad in plan view with an essentially circumferential elasticated band 48 to ensure that the cleaning pad fits tightly over the head (not shown). Figure 24 shows a variant of this design wherein the elasticated band 48 is replaced by a draw-string 54 that may be tightened and the tied around a handle (not shown).

Figure 21 shows yet another cleaning pad in plan view and end-section wherein the elongate tab portion 44 terminates in a projection 49 which will be oriented between the opposed handle sections 39a,39b or alternatively the head sections 40a,40b. As the handle sections are closed the projection 49 will be trapped between said opposed sections and thereby fasten the cleaning pad to the head.

Claims

1. A cleaning device comprising a handle having towards one end a grip portion and trigger means, and at the other end a head adapted to receive a cleaning pad in the form of a slipper, the head comprising a bottom surface which bears against a surface to be cleaned; and fixing means actuated by the trigger to releasably fix the cleaning pad to the head wherein fixing means are provided on the device other than on said bottom surface.

2. A cleaning device according to claim1 wherein the handle comprises to handle sections which are configured in a complementary manner such that when they are brought together in opposed relationship they form conjointly the handle.

3. A cleaning device according to claim 2 wherein the head comprises to head sections which are configured in a complementary manner such that when they are brought together in opposed relationship they form conjointly the head.

4. A cleaning device according to claim 2 or 3 wherein the head or handle sections are mounted pivotally such that they open and close in opposed relationship in a scissor-like manner.

5. A cleaning device according to any of the claims 2 to 4 wherein the pivot is provided on the handle in a position proximal to the head.

6. A cleaning device according to any of the preceding claims wherein the fixing means is provided on the handle.

7. A cleaning device according to claim 6 wherein the fixing means is a bore provided through the handle in a direction essentially normal to its length which bore receives a portion of a cleaning pad which passes through the bore to snag or catch the handle.

8. A device according to any of the preceding claims additionally comprising ejection means which actively disengage the cleaning pad from the fixing means to facilitate removal of the cleaning pad from the device.

9. A device according to any of the claims 2 to 8 wherein the fixing means is disengaged and the ejection means is actuated by the user opening the handle sections.

10. A cleaning pad adapted for attachment to a cleaning device as hereinabove described.

11. A cleaning pad in the form of a slipper comprising a body defining an internal cavity for receiving a head of a cleaning device and extending outwardly in a direction away from said cavity an elongate tab portion which is adapted to engage with the fixing means thereby to fix the cleaning pad to the head.

12. A cleaning pad according to claim 11 wherein the elongate tab portion is T-shaped and optionally contains an adhesive surface for fixing to the cleaning device.

13. A cleaning pad as hereinabove defined having secreted therein a cleaning composition.

14. A container comprising a plurality of cleaning pads as hereinabove described.

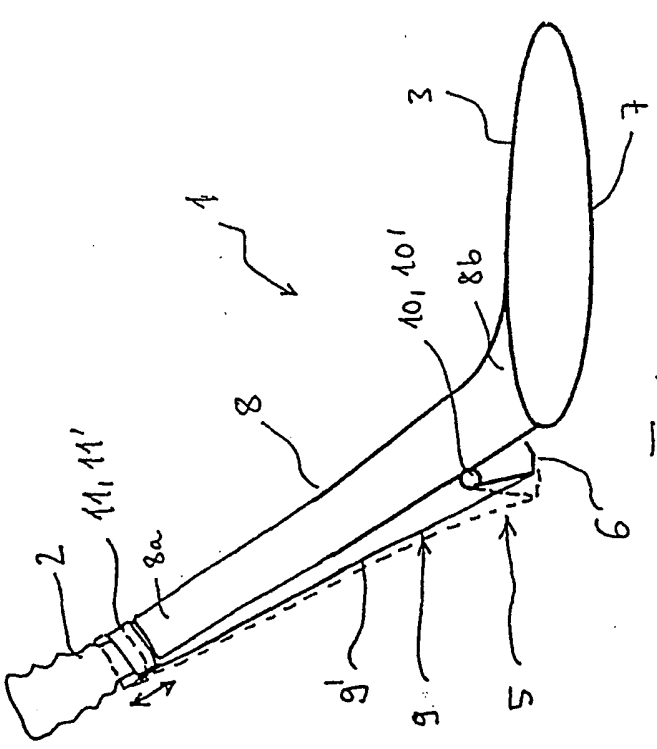
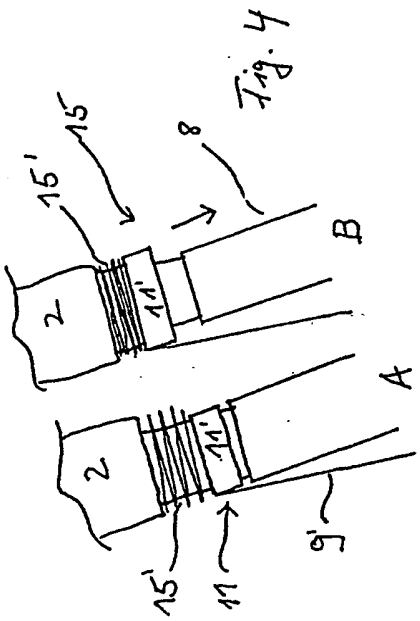


Fig. 1



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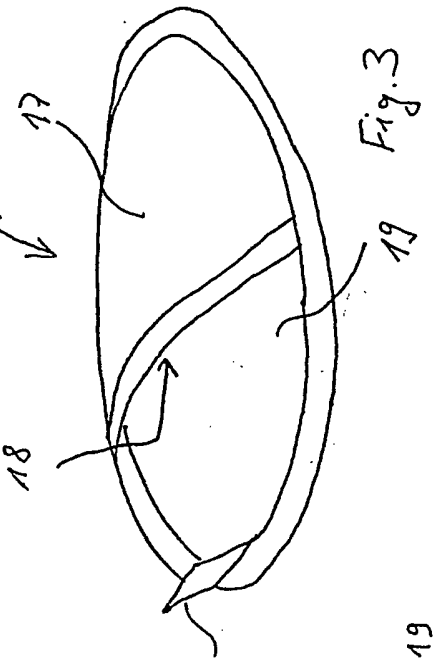


Fig. 3

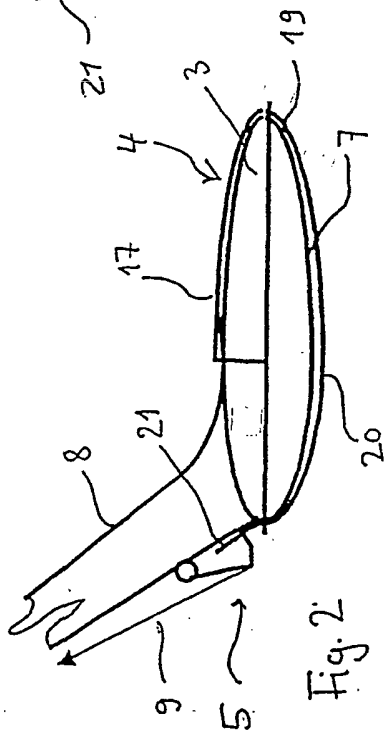


Fig. 2

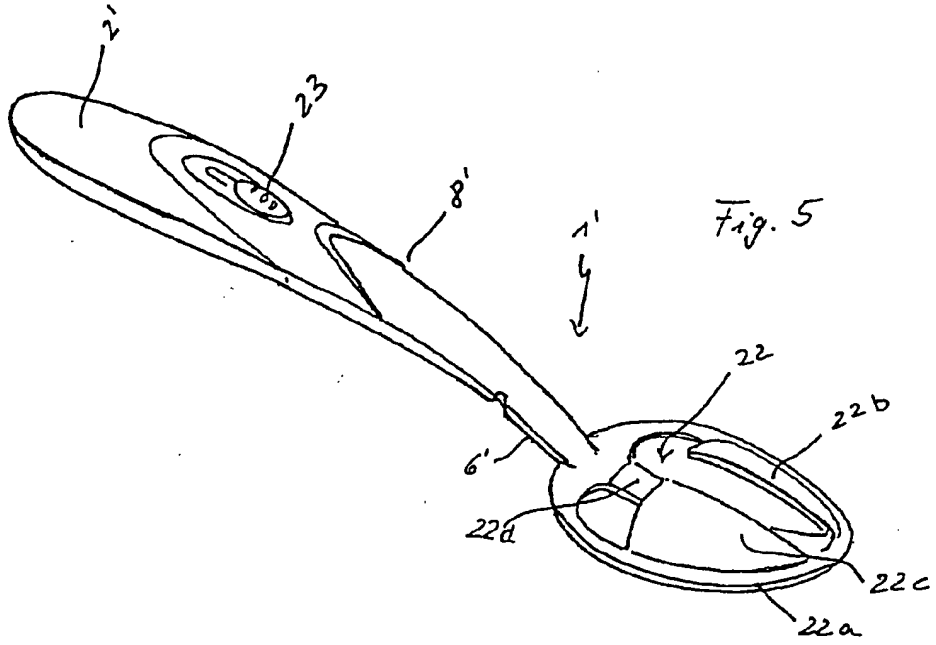
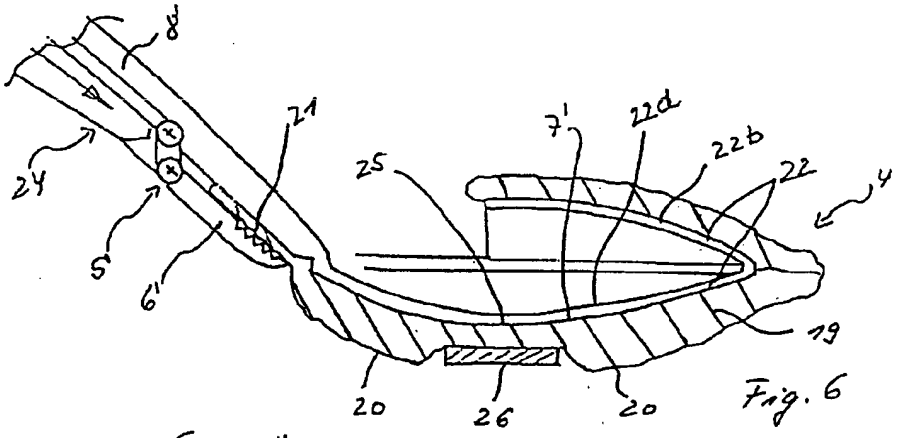


Fig. 5



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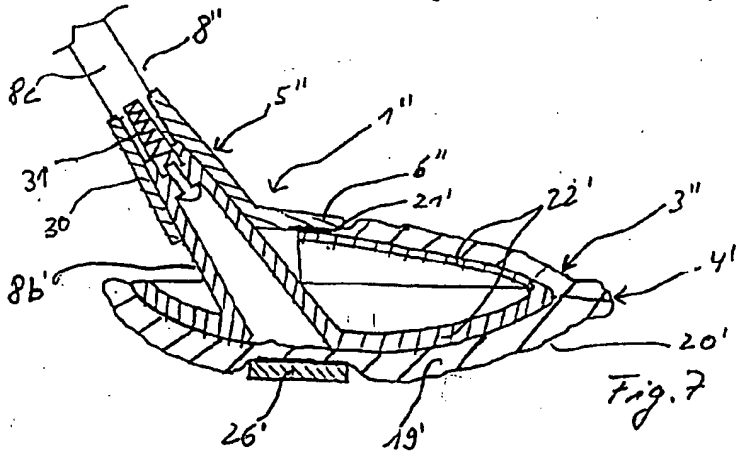

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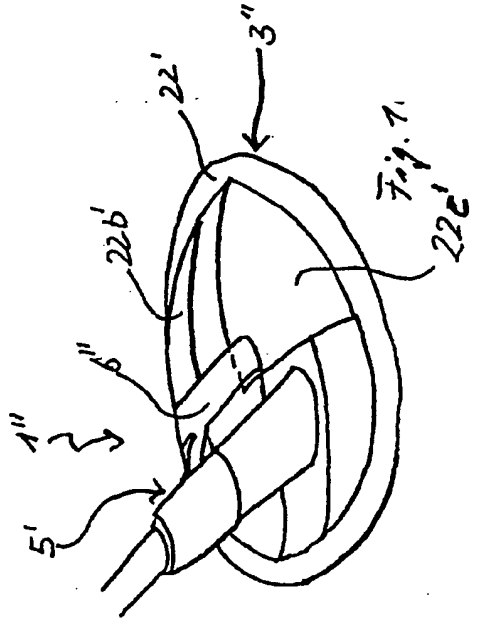
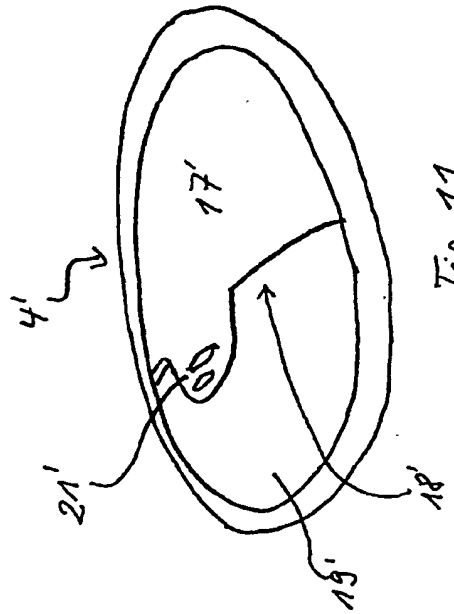


Fig. 7



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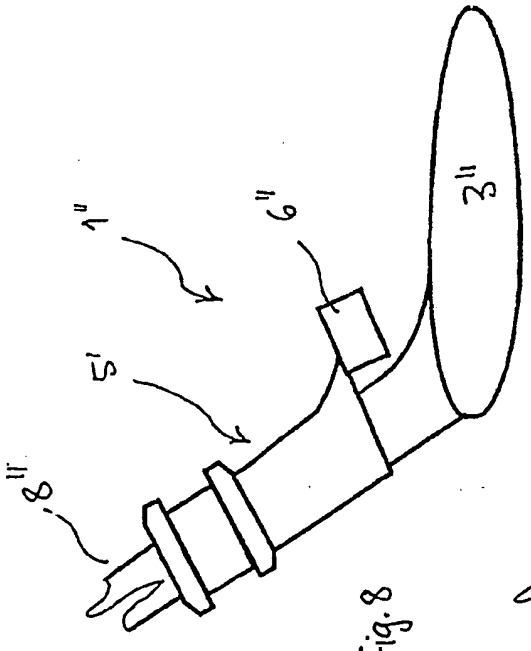


Fig. 8

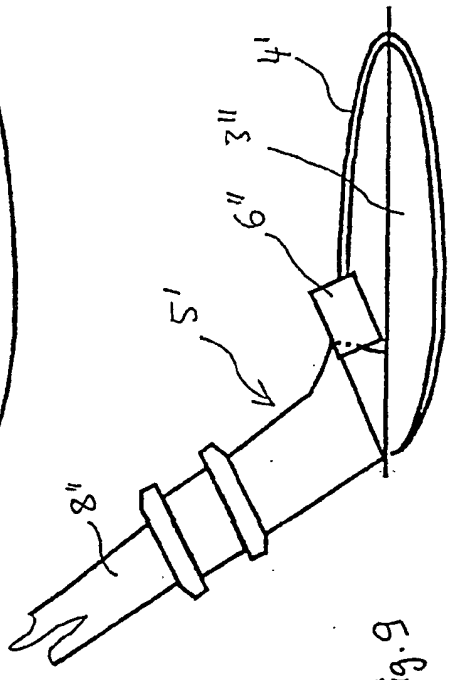


Fig. 9

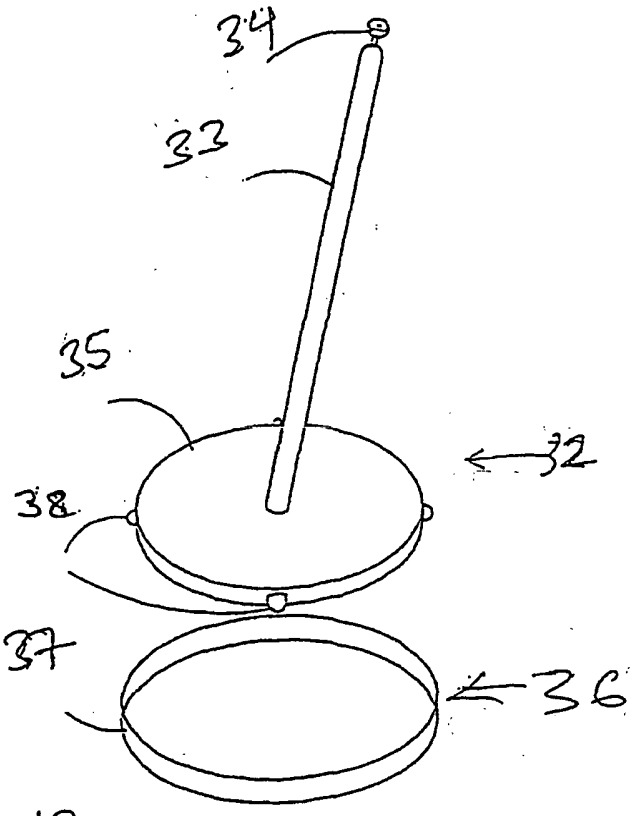


Fig 12

Fig. 13

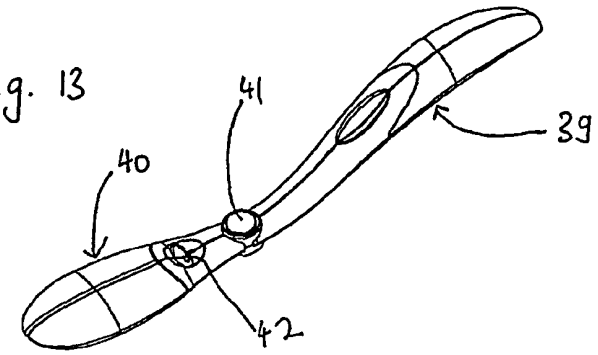


Fig 14

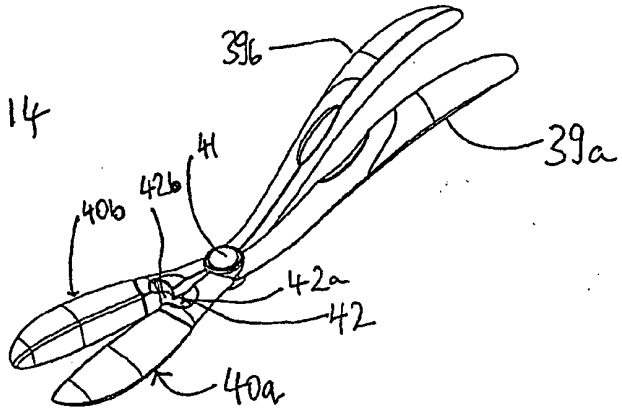


Fig. 15

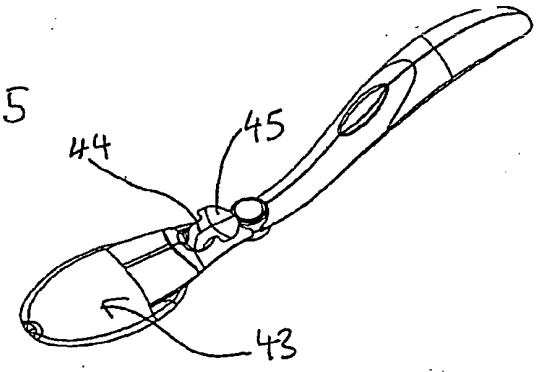
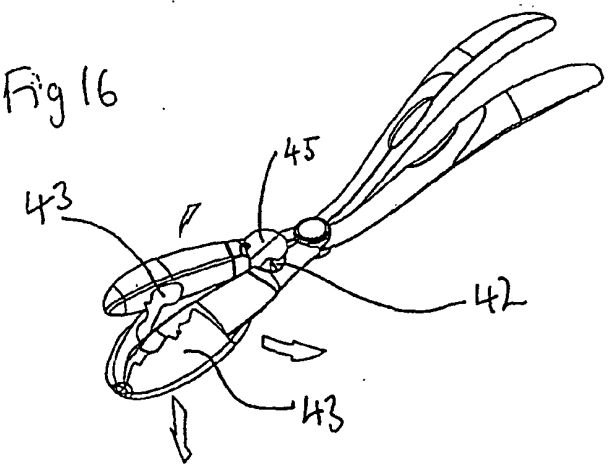
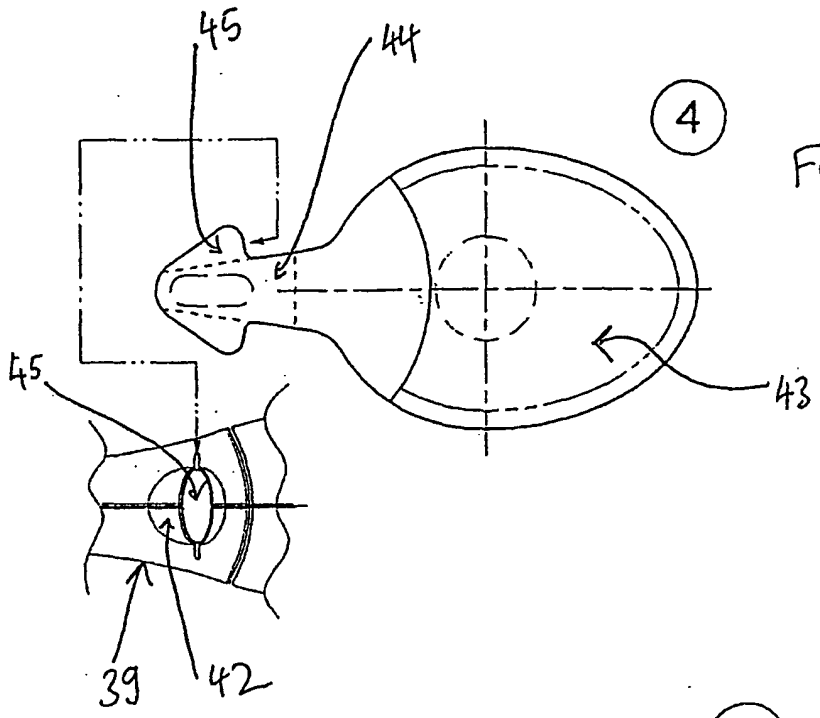


Fig 16





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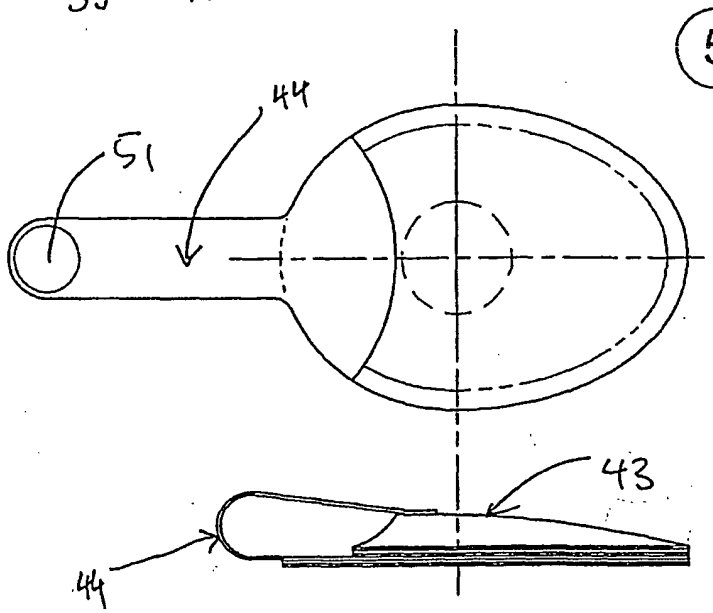

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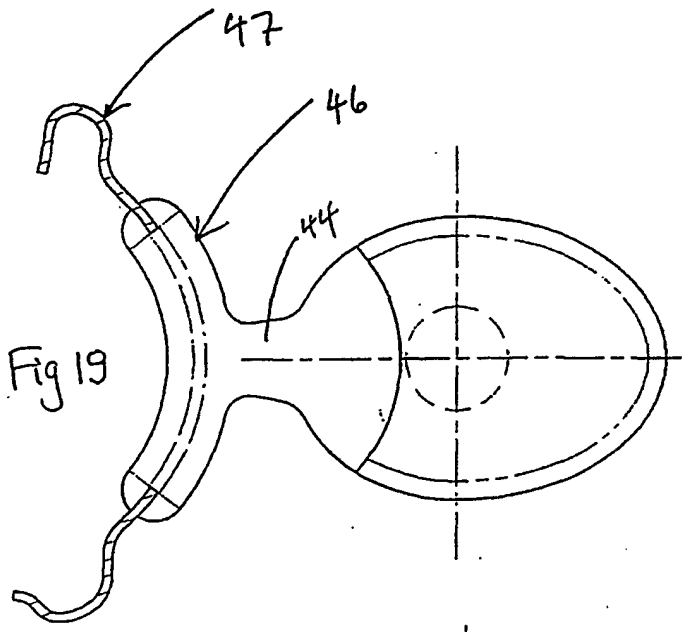
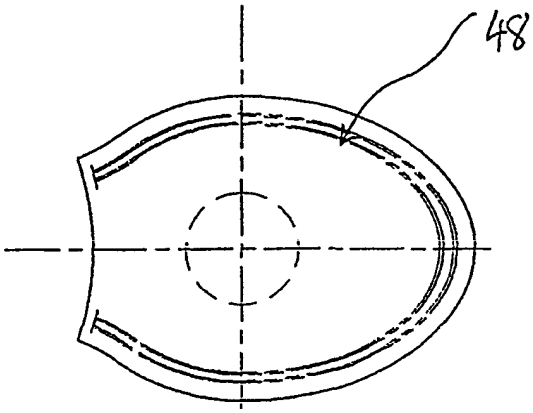


Fig 19



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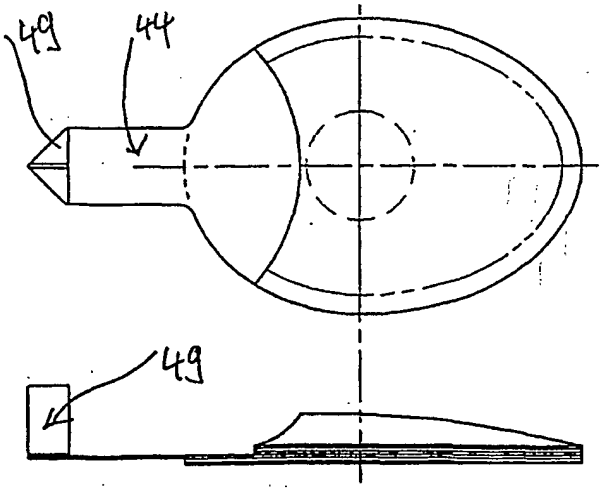

Fig 21

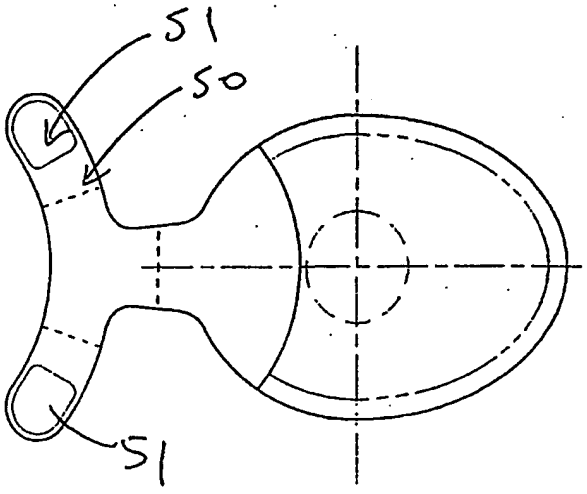

Fig 22

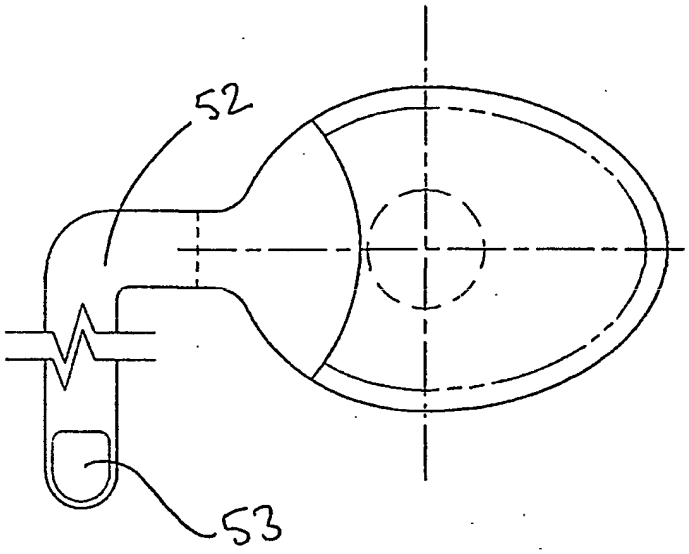

Fig 23

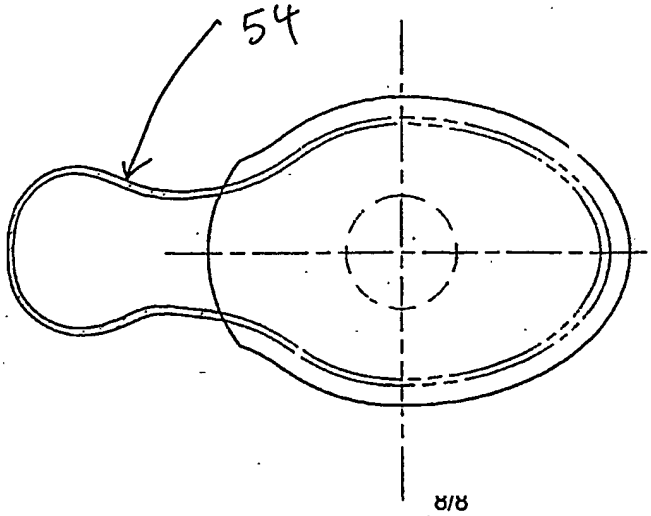

Fig 24

INTERNATIONAL SEARCH REPORT

Inte al Application No
PC I/ER 01/10643

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A47K11/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A47K A47L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 35 26 085 C (M. KÜGLER) 26 March 1987 (1987-03-26) figure 12	1,6,8,10
X	US 5 630 243 A (FEDERICO VERA L ET AL) 20 May 1997 (1997-05-20) the whole document	1,10,13
X	US 1 681 967 A (ZORN JOHN B) 28 August 1928 (1928-08-28) the whole document	1-6,8-10
X	US 5 953 784 A (HIRAYAMA HARUNOBU ET AL) 21 September 1999 (1999-09-21) figures 12,15-17,28	10,11, 13,14

-/--

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
17 January 2002	24/01/2002

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Delzor, F

INTERNATIONAL SEARCH REPORT

Inte nal Application No
PCT/EP 01/10643

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 3 225 375 A (ATKINSON RALPH L ET AL) 28 December 1965 (1965-12-28) the whole document -----	1-4,10, 13

INTERNATIONAL SEARCH REPORT

Information on patent family members

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